C-A OPERATIONS PROCEDURES MANUAL

4.44.2 Procedures for Downloading a PASS PLC Program into EEPROM Memory Module And Uploading the Program to RAM

Text Pages 2 through 7

Hand Processed Changes

HPC No.	Date	Page Nos.	Initials
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Revision No. 00

Approved: _____Signature On File_____ _____
Collider-Accelerator Department Chairman Date

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4.44.2 Procedures for Downloading a PASS PLC Program into EEPROM Memory Module and Uploading the Program to RAM.

1. Purpose

1.1 This document describes the steps required to download an Allen Bradley PLC program into an EEPROM memory module (1785ME64 or equivalent). This procedure covers the B-division hardware only. This procedure will also cover installation of the EEPROM module into the Particle Accelerator Safety System (PASS) PLC processor module, as well as testing of the system to verify proper downloading and operation. The PLC processor module contains an opening on its front to permit installation of the EEPROM module. The EEPROM module is a 2.75-in. by 5.25-in. memory module. This module permits a copy of the active program currently running in processor memory to be stored and downloaded to active RAM by simply cycling the PLC power supply off and back on. Applicable to B Division PASS System in Building 921 Peers 3, 23 & 25

2. Responsibilities

2.1 Prior to implementation of any changes to previously baselined PASS hardware or software system logic, the cognizant RHIC Safety Systems Section Head (SSSH) is responsible to request they be reviewed and approved.

2.2 The RSC Chair is responsible for reviewing this procedure in a manner consistent with the review cycle for the RSC procedures.

2.3 After a program is downloaded to EEPROM the responsible individual performing the download shall verify that the EEPROM checksum matches the checksum of the source code. In addition a comparison shall be made of the original ladder logic program and the program that is now loaded in the EEPROM using Allen-Bradley ControlGuardian software.

3. Prerequisites

3.1 The only person permitted to download software into the EEPROM modules will be the designated individual assigned responsibility for either A-Division software or B-Division software.

4. Precautions

4.1 Handling of EEPROM modules and Allen Bradley Processor modules shall be done with extreme care. Handling techniques designed to minimize static electricity shall be followed.

4.2 The PLC processor should **NEVER** be removed or installed without first powering down the rack

5. **Procedure**

5.1 The following procedure will describe the steps for downloading the PLC Program into the EEPROM Memory Module, using an Allen Bradley Test Station and a Development System.

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NOTE: It is Critical that the Test Station used to burn the EEPROMS not have a higher Processor Series Level than the B division processors in building 921. EEPROMS will not download properly if this is the case. EEPROMS burned in different series level processors are not downward compatible. Before proceeding with the download a note should be made of the processor series levels in building 921. The test station processor should have a series level lower than the field processors.

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5.2 Once you have verified that you have selected the correct program (for the AB system in question) to download and this program is operating normally, you can begin the download procedure to write the program into the EEPROM module. Downloading will be done via a development station to a non PASS Allen Bradley (AB) test system with a lower series rev. level than the field processors. The EEPROM module will then be physically transferred and installed in the PASS system in question.

5.2.1 Turn off power to the AB test system and remove the processor from the chassis.

5.2.2 Verify the I/O chassis backplane switches are set as follows: switch 6 to the **ON** position and switch 7 to the **OFF** position.

Note:
If the switches must be reset do not use a pencil because the tip can break off and short the switch.

5.2.3 Reinsert the processor into the chassis.

5.2.4 Insert the memory module into the processor with the keying pin in the down position. When the memory module is inserted correctly you will hear the connector pins on the back of the memory module snap together with the mating connector in the processor. The triangle on the front edge of the EEPROM module should be facing down when the EEPROM is inserted correctly.

***********Attention:***********
The EEPROM Module Should Never Be Inserted Or Removed With Power ON to the Processor.

5.2.5 Turn on power to the processor and I/O chassis.

5.2.6 Put the processor in **Program** mode. If you try to write to the EEPROM module when the processor is in any other mode, you receive a "**NO ACCESS OR PRIVILEGE VIOLATION"** message.

5.2.7 When the correct program has been selected download your program online to the PLC RAM making sure you initialize your data table values and **record the checksum.**

5.2.8 Transfer a duplicate of your program to the EEPROM memory module in the following manner:

5.2.9 Make sure the processor is in the **online** mode. If it is not in the online mode proceed to put it in the **online** mode.

If the development software is PLC5 Ladder Logic follow steps 10 – 13.
If the development software is Wintelligent Logic 5 follow steps 14-15.
If the development software is RSLOGIX 5 follow steps 16 – 17.

5.2.10 Go to the ladder editor Main Menu.

5.2.11 Select "General Utilities" – [**F7**].

5.2.12 Select **"**Write EEPROM**" –** [**F7**].

5.2.13 When prompted enter "Yes"[**F8**]

5.2.14 Select "Ladder Tools"

5.2.15 Select "Burn EEPROM"

5.2.16 Select "Comms" menu

5.2.17 Select "Store to EEPROM"

5.2.18 As the program is downloading to the EEPROM the "PROC" LED on the processor flashes green and the development system beeps until the write procedure is completed. If the write procedure was successful, you should see the following message displayed: **"**EEPROM SUCCESSFULLY BURNED".

5.2.19 Turn power off to the I/O chassis and processor.

5.2.20 Remove the processor and set the backplane switches as follows: switch 6 to the **OFF** position and switch 7 to the **OFF** position.

5.2.21 Insert the processor in the chassis.

5.2.22 Turn the power on to the chassis.

5.2.23 Verify that the key switch is in the **RUN** position.

5.2.24 The program will automatically download from the EEPROM to processor RAM.

5.2.25 **Record the Checksum.**

5.2.26 **Make sure the checksum compares with the checksum in step 7 above.**

5.2.27 Turn power off to the processor chassis.

5.2.28 Grasp the finger grip tabs and firmly pull the memory module out of the processor.

5.2.29 After writing to the EEPROM module, remove the write protection jumper using a pair of needle nose pliers. Once the jumper is removed, you cannot write to the memory module.

5.2.30 Label the EEPROM module in the space provided with a pencil with the following information:

Program name:
Rev. level:
Date:
Checksum:

Note:
Insert The EEPROM In An Anti-static Bag As Soon As The EEPROM Is Removed From the Allen Bradley Test Station.

5.3 The following procedure will describe the steps for installing the programmed EEPROM Module in the Designated PASS System.

This should only be performed by a qualified individual

5.3.1 Turn off power to the AB PLC system where the EEPROM module will be installed and remove the processor from the chassis.

5.3.2 Verify the I/O chassis backplane switches are set as follows: switch 6 to the **OFF** position and switch 7 to the **OFF** position.

5.3.3 Reinsert the processor into the chassis.

5.3.4 Verify the Keyswitch is in the **RUN** position.

5.3.5 Remove the EEPROM module from the anti-static bag.

5.3.6 Verify the Write Protect jumper has been removed from the EEPROM.

5.3.7 Insert the EEPROM memory module into the processor with the keying pin in the down position. When the memory module is inserted correctly you will hear the connector pins on the back of the memory module snap together with the mating connector in the processor. The triangle on the front edge of the EEPROM should be facing down when the EEPROM is inserted correctly.

Attention:
The EEPROM Should Never Be Inserted Or Removed With Power On To The Processor.

5.3.8 Turn on power to the processor and I/O chassis.

5.3.9 Program transfer and execution begin immediately with the key switch in the **Run** position.

5.4 The following procedure will describe the steps required for Verifying the Program Downloads from the EEPROM module to PLC Memory.

5.4.1 Verify the checksum in memory corresponds to the checksum written on the left side of the EEPROM module.

6. **Documentation**:

The initial load and install shall be documented in the log along with the compare results and the checksums.

7. References

7.1 Allen Bradley publication 1785-5.10 September 1995 – Enhanced PLC-5 and Ethernet PLC-5 Programmable Controller Memory Module.

7.2 Allen Bradley publication 1785-2.7 October 1998 – PLC5 Programmable Controller Memory Modules.

7.3 Memo from T. Tallerico to Neville Williams dated 11/16/99 (EEPROMS used in the Building 921 PASS System).

8. Attachments

None.